

**Department of Homeland Security (DHS) Science and Technology Directorate (S&T)
Homeland Security Science and Technology Advisory Committee (HSSTAC)**

September 27 – 28, 2012
1120 Vermont Avenue, NW
Conference Room 5-212
Washington, DC 20005

MINUTES

Summary: About 35 people attended the inaugural session of the reconstituted HSSTAC, including 9 committee members and 7 members of the public. (See Attendee List, Page 11/12).

September 27, 2012

1. CONVENE AND INTRODUCTION TO DHS S&T

HSSTAC Executive Director and Designated Federal Officer Mary Hanson convened the meeting at 9 a.m. and read a statement regarding conflicts of interest. She added that members of the public were present.

Under Secretary for S&T Tara O’Toole welcomed committee members to the inaugural session and thanked them for their service. She explained that their interaction and collaboration with herself and other S&T staff would focus on their expertise and experience, and is intended to guide and develop the growth of the Directorate through their advice on a variety of levels—technical, strategic, policy, and so on. She highlighted the importance of their input and their role in improving S&T’s mission effectiveness.

O’Toole then briefed the members on the background and mission of S&T—which she described as the science and engineering core of DHS—and its relationships with DHS Components and other stakeholders. She explained the size and diverse nature of DHS and the operational nature of Components, many of which are not technically oriented or familiar with the role or function of research and development (R&D). She emphasized that strategic goals must be considered within the context of operational reality. She delineated the missions and focus areas of DHS and the importance of facilitating secure trade, travel, communication, etc., while also providing resiliency in the face of major incidents. She then discussed the value of S&T to DHS Components and stakeholders; for instance, to help improve efficiency and operational effectiveness; save lives, time, and money; and provide long-term return on investments (ROI). She emphasized the importance of partnerships with Components, especially their leaders and operators. She emphasized S&T’s unique bio-defense responsibilities and its role as R&D funder for civilian cyber security. She explained that at a more strategic level, she wanted to help incorporate systems engineering and analytical processes into DHS decision-making—a key area for committee advice. Finally, she gave an overview of budgetary challenges, pointing out that S&T receives about \$1 billion out of \$54 billion dollars allocated to DHS. She highlighted the significant cuts to research and operations budgets in recent years and described this trend as “unsustainable.”

2. DHS S&T STRATEGY AND PROCESS – DAN GERSTEIN

Deputy Under Secretary for S&T Dan Gerstein gave more details on the role of S&T and its relationships with DHS Components, interagency partners, and state, local, tribal, and territorial (SLTT) stakeholders, as well as its role in the international arena and its involvement with academia and the private sector. He described the role of S&T as “larger than delivering technology.” He emphasized the need to be operationally focused and innovative and to build partnerships. He explained that S&T’s mission guidance was built around an analysis of threats and challenges, ranging from tactical difficulties facing first responders to full-scale national emergencies. He noted that S&T’s mission directly supports a variety of Homeland Security Presidential Directives (HSPDs) and involves customers or partners across government mission areas, such as Critical Infrastructure and Key Resource (CI/KR) management and law enforcement. He mentioned the 53 percent “real reduction” in S&T’s budget from FY10 to FY12. **Casani** asked about allocations between discretionary and non-discretionary R&D. **Gerstein** explained that much discretionary funding focuses on R&D through university Centers of Excellence (COEs), partnerships with national labs, and efforts led by the Homeland Security Advanced Research Projects Agency (HSARPA). He pointed out that many DHS Components focus on policy or operational issues, and S&T needs to lead in the R&D arena. He emphasized again the importance of partnerships and operational relevance. S&T could help alleviate budgetary concerns, he said, by focusing on late stage technologies, successful transition and commercialization efforts, and reducing projects with less likelihood of success. **Carrano** asked about the effects of recent budget cuts and mentioned the importance of disruptive technology as an equalizer. **Gerstein** agreed that this is a key area to pursue, adding that tech foraging has also proven effective. He added that S&T is trying to help Components to develop requirements and invited HSSTAC input in this area. **Gerstein** closed his remarks by observing that S&T had experienced a number of challenges but also some successes, such as the development, with COEs, of a vaccine for Foot and Mouth Disease (FMD). **Levis** asked about the nature of resiliency and its role in the attack chain. **O’Toole** explained that resiliency as a goal is still developing and had been recently adopted across several agencies. She noted that its definition is still somewhat ambiguous and suggested this could be a good area for committee study.

3. ALL ABOUT S&T

HSARPA OVERVIEW – PAUL BENDA

Paul Benda, Director of the Homeland Security Advanced Research Projects Agency (HSARPA), briefed the committee on its role and mission. He explained that HSARPA is the primary source of innovation for the Department but should not necessarily be compared with the Defense Advanced Research Projects Agency (DARPA), since the latter had a much larger budget and a more integrated and established system to identify and transition projects. He pointed out that because of its varied stakeholders, HSARPA has to work with disparate levels of readiness and understanding. Successful transition is an ongoing challenge, he said, and a key reason that S&T is pursuing partnerships with the Components— to help ensure that S&T is working on component priorities and to position technologies for market adoption. HSARPA had experienced changes in recent years, he said; it is now less focused on basic research and more on transition and partnering, aiming to help Components do their jobs better, faster, and cheaper. S&T also wants to help increase its stakeholders’ technical prowess through education, he said, and eventually become a science and technology

clearinghouse for the Homeland Security Enterprise (HSE). **Casani** commented that this is a significant mission and could be cumbersome or risk mission creep, noting that best practices or legal issues might be outside the scope of S&T's responsibilities. **Benda** responded that advice could be tailored to specific needs and argued that if S&T didn't provide this information, stakeholders may need to reinvent the wheel or rely on vendor-driven information. **O'Toole** explained that S&T is designated by statute as the source of best practices for science and technology for first responders. She agreed that S&T should focus on missions and capabilities that are aligned to its priorities. Further discussion between **Casani, Griffin, Carrano, and O'Toole** addressed the extent to which S&T could achieve this while maintaining objectivity, and the proper roles and responsibilities of state and local governments in decision-making and prioritizing. **Benda** emphasized that HSARPA's ultimate goal is to impact stakeholder operations, but it could be somewhat agnostic regarding how that occurred. S&T doesn't seek to sell a particular program or project, he added; its partners can determine the best solutions and practices for their needs. He added that S&T is broadly focused on certain areas of national interest, such as biological detection and response, cyber security, explosives, and CI/KR – but stakeholder buy-in is critical to successful transition and deployment. The portfolio review process is one means to develop and guide successful efforts, he said, and has been helpful in defending budgetary choices to Congress. **O'Toole** offered some examples of CI/KR-related projects that had been re-directed or dropped after the portfolio review process, often due to concerns about transition or commercialization. **Carrano** mentioned the importance of systems engineering and the need to consider potential challenges such as training or budget issues. **Benda** agreed and emphasized the need to understand context and operational requirements of any project.

FRG OVERVIEW – BOB GRIFFIN

Robert Griffin, Director of the First Responder Group (FRG), briefed the members on the background, efforts, and challenges facing the FRG and the unique nature of its diverse and widespread stakeholders, who collectively incorporate thousands of systems, best practices, and operational requirements. Given this stakeholder base, he said, it is critical for FRG to work on areas of common concern across the first responder community (FRC), especially communications, data sharing, and responder safety and effectiveness. He observed that training and budget issues are a significant concern across this base, and any technical solutions fielded by FRG should be user-friendly and affordable in order to ensure consistent and long-term use. **Griffin** described the FRG as four groups focused on different areas of responsibility, working with each other and with laboratories to build technical solutions to operational problems that are solicited from the FRC. As an example, he described how FRG has coordinated with the Department of Agriculture and the California Department of Forestry and Fire Protection to improve the design of firefighter gear. **Carrano** asked about the role of disruptive technology. **Griffin** responded that the challenges in this area are partly the result of FRC culture and habits, and added that FRG needed to help the FRC adjust to potential game changers as they arise.

ASOA OVERVIEW – DEBRA DURHAM

Debra Durham, Director of Acquisition Support and Operational Analysis (ASOA), explained its mission to guide the analytics, systems engineering, and testing and evaluation within DHS. She emphasized the need to tie together the development activities of DHS Components and to include the perspective of the operational end-user. She noted that ASOA has worked extensively with Federally Funded Research and Development Centers (FFRDCs) and is working to develop models to assess and analyze risks across DHS. **O'Toole** pointed out that this is a new and important part of S&T's mission, and that systems engineering had not been pursued before, to this degree, within DHS. She invited HSSTAC advice on how to leverage limited resources to make DHS more systems-based and analytical. **Durham** added that ASOA has partnered with the National Institute for Standards and Technology (NIST) and with COEs, and is working to provide assessments and information to the FRC and other stakeholders. **Depoy** asked about the size and budget of the primary FFRDCs. **Durham** responded that the Homeland Security Systems Engineering Development Institute (HS SEDI) handles about \$100 million worth of projects, and the Homeland Security Studies and Analysis Institute (HSSAI) manages about \$30 million. She added that ASOA's stakeholders are also diverse and span the breadth of the HSE, making data-driven analytics and data integration even more important. She added that this could be a critical area for HSSTAC study. **Levis** asked about transition and transformation goals and how they differ from DoD's. **Lister** interjected that he was impressed by the extent of S&T's efforts here, and also wondered how S&T's efforts differ from DoD's. **Durham** responded that ASOA partners with other agencies as needed and was working out the transition process.

Note: The RDP Overview was delayed to the afternoon because of a scheduling conflict.

DISCUSSION – WHAT KEEPS YOU UP AT NIGHT?

Griffin began the discussion by describing his key challenges and the need to resolve them or mitigate their impact. He highlighted the need to consider the overall capacity of the HSE and its response capacity, especially given the FRC's vast requirements and scarce resources. He wondered how to increase the lifespan and efficiency of equipment and how to continue to "break into" the community and address its needs. He pointed out that the complexities of the FRC bring unique challenges to the management, coordination, and guidance of solution development. He added that it is difficult – but critical – to forge relationships with FRC leaders who can make decisions regarding budgets, policy, and transition.

Gerstein noted that cyber security is a major area of concern, especially since DHS is responsible for protecting the .com domain. He added that "big data" and requirements are his other areas of concern. A lack of analytical rigor or proper understanding of requirements is often enough to sideline or terminate a project, he said. He mentioned the convergence of technologies, which can give "state-like capabilities to non-state actors." He wondered how to balance the process of innovation with a linear process like systems engineering.

Benda spoke about the difficulty and complexity of operating within DHS. He said the department is blamed for every problem or perceived failure throughout the interagency, leading to a risk-averse culture which makes it difficult to make quick decisions or to attract innovative staff. From a threat perspective, he said he was concerned generally about the ability to respond

to more than one major attack—but more specifically about cyber and biological attacks. Those risks are complicated by ambiguous roles and responsibilities within the SLTT, he added.

Durham identified two primary areas of concern; internal communication stovepipes and the proper alignment of resources against requirements. She noted that her concerns may be somewhat unique since ASOA is relatively new and still evolving.

O'Toole identified people and processes as her first concern, commenting that it is difficult to attract and retain effective personnel. Strong engineers and scientists are critical to the S&T mission and need to also be placed in DHS Components, she said; however, this is made difficult by a confluence of events, including decades of criticism or devaluing of government service and a challenging personnel management system. It is also important to improve S&T's standing within DHS and the broader interagency, she added; R&D seems to be under-valued across the government and is vulnerable to budget cuts. **Kamen** commented that he views personnel as a primary issue which should be addressed immediately. **Bellovin** observed that retaining the right people seems to be a challenge across the government. **O'Toole** agreed with their assessments and reassured the committee that S&T staff are motivated and focused on the mission. She added that the committee could provide value by highlighting this concern to others. Discussion continued about this issue among **Carley, Casani, Carrano, Levis, Lister** and **O'Toole** as they considered various ways to address human resources, staff retention, and organizational culture.

ALL ABOUT S&T (CONTINUED) – RDP OVERVIEW - DAN GERSTEIN

Dan Gerstein, Acting Director of Research and Development Partnerships (RDP), explained that RDP has helped grow S&T's value within DHS by fostering coordination and innovation between S&T and a variety of organizations such as the Department of Energy (DOE) and its labs. Increased collaboration among laboratories has resulted in an increased focus on biological threats, he said, and S&T is now working to support customers across the breadth of bio-defense. He added that inroads have been made with interagency partners such as the defense and intelligence communities. **O'Toole** explained that S&T's labs are managed by different entities and handle classified information, which makes it difficult to partner with universities. **Gerstein** pointed out that DHS has worked extensively with universities and has sponsored a network of 12 university COEs which he called “very entrepreneurial.” **O'Toole** added that the COE program has existed for nearly 10 years and is showing significant results, highlighting the importance of long-term relationships. **Gerstein** then discussed the role of other engagement methods, including Public-Private Partnerships (PPP), international partnerships, and long-range broad area agreements (BAAs.) **Lister** asked about BAA response rate. **Gerstein** responded that about 200 responses are received each year and emphasized that the long-range BAA is designed to solicit proposals on a rolling basis. He added that technology foraging is a key effort in RDP and helps reduce superfluous efforts and increase the efficiency of S&T and its partners. **Kamen** observed that it must be difficult for international partners to work with the U.S. government and asked how S&T manages this. **Gerstein** responded that, while it is a challenge, DHS does not differ much from other agencies in this regard. Discussion continued among **Lister, Gerstein, Kamen,** and **O'Toole** regarding strategies to ease these challenges, including the role of Other Transaction Authority (OTA) and the importance of fostering a culture of innovation.

4. HOW S&T WORKS (BUDGET) – DICK WILLIAMS

Dick Williams, the Chief Financial Officer (CFO) of S&T, gave an overview of the S&T budget and funding environment. He emphasized how little discretion exists in the R&D budget, which includes support to labs. Budget cuts have required S&T to prioritize and reduce projects from about 200 to about 60. The FY13 budget looks better, he said, but will be difficult to maintain. He emphasized that the budget environment calls for clear priorities.

5. DHS HISTORY AND OVERVIEW – KEN RAPUANO

Ken Rapuano, Director of Advanced Systems and Policy at MITRE Corporation, former Deputy Homeland Security Advisor to President Bush and former member of HSSTAC, gave a briefing on the creation, mission, and evolution of DHS and the challenges it faced in its first decade. He emphasized that there is no more complex mission space in the federal government than homeland security, noting that the traditional national security space is smaller and considerably more homogenous. He explained that DHS was formed following the 9/11 attacks to improve coordination and efficiency in preventing and mitigating significant threats to homeland security, and is now the third largest agency by budget and staff size, with a budget approaching \$70 billion in FY13. He described DHS goals and priorities as outlined in the Quadrennial Homeland Security Review (QHSR). He discussed the interagency coordination process, led by DHS, and executive branch processes for developing and coordinating the implementation of homeland security policies. He described the complexity of Congressional oversight of DHS, which is spread across many committees. He noted that efforts to define homeland security – both as an area of practice and as a policy issue – are ongoing and evolving. He highlighted the operational nature of many DHS stakeholders, particularly at the SLTT level, adding that the SLTT is often primarily focused on day-to-day issues and don't have the luxury to focus on lower probability/higher consequence risks for which DHS has an important responsibility. He emphasized the wide range of perceptions of risk in the homeland security spectrum, and how those perceptions drive dissimilar priorities for different stakeholders. **Carrano** commented on the spectrum of risk, from low probability/high consequence to high probability/low consequence, and observed that S&T seems to focus on one end of the spectrum but there isn't a need to choose. **Rapuano** responded that tension exists between SLTT and federal requirements, and that S&T has to balance its focus tactical as well as strategic requirements in its support to the FRC. He emphasized that 38 federal departments and agencies support emergency response and the coordination between these entities is complex and requires significant coordination to be effective. An understanding has evolved that not every threat can be mitigated, he said, and this understanding has led to a necessary focus on resiliency. A discussion ensued among **Carrano, Rapuano, Casani, Bellovin, and O'Toole** regarding thresholds of acceptable risks and acceptable consequences, and how to measure them. **O'Toole** highlighted the role that S&T has played in producing risk assessments for various threats and mentioned that S&T has a statutory responsibility to assess chemical, biological, radiological and nuclear (CBRN) risk. Committee members then discussed potential methods to analyze and respond to evolving scales of threat, and how to delineate roles and responsibilities for SLTT and federal entities. **Rapuano** ended by recommending that S&T build upon its current emphasis on taking a systems approach, by assessing the full 'threat chain' associated with different mission outcomes, to identify those areas where technology can provide the highest return on investment to achieving mission outcomes. As an example, he described how the Joint Improvised Explosive Device Defeat Organization (JIEDDO) evolved from its original focus on the point of explosion, by moving 'left of boom' to address the broader threat chain of activities and

associated signatures involved with IED attacks, to identify higher impact solutions focused on more on the root versus the symptoms of the problem. Information and systems integration are critical to success, he said. He emphasized the need to keep in mind the practical requirements and capabilities of end users.

Note: The HSSTAC Introduction and History was delayed to allow more time for discussion.

6. FACA BRIEFING – GEORGIA ABRAHAM

DHS Committee Management Officer Georgia Abraham briefed the members on the Federal Advisory Committee Act (FACA) and the operation of advisory committees. She discussed the roles, responsibilities, and restrictions of members of FAC committees. Committee members asked questions regarding the creation and conduct of subcommittees, justification for closing meetings, and requests to testify to Congress.

7. ETHICS BRIEFING – TROY BYERS

DHS Ethics Attorney Troy Byers briefed on the legal and ethical requirements of Special Government Employees (SGEs) who serve on FAC committees and the restrictions associated with that role. Committee members asked questions to clarify guidance regarding privileged information and the extent to which members can publicly declare their HSSTAC membership.

8. ADJOURN: **Hanson** adjourned the meeting at 4:30 p.m.

September 28, 2012

1. CONVENE: **Hanson** convened the meeting at 9 a.m. and read a statement regarding conflicts of interest. She added that members of the public were present.

2. HOW TECHNOLOGY CAN ADDRESS HOMELAND SECURITY CHALLENGES

O'Toole emphasized that she invites a range of inputs from HSSTAC, both formal and informal – possibly through a report to Congress, or specific reports on discrete issues, or subcommittees (for example, to advise TSA on the health effects of technology). She emphasized again the desire to drive DHS towards analytics and systems-oriented thinking, but also mentioned practical questions such as how to handle the budget environment. She explained that this session of the agenda would encompass three areas: innovation, emerging threats, and big data.

A. ECOSYSTEM OF INNOVATION

O'Toole pointed out that within the field of R&D, innovation is critical to maintaining relevance, breaking new ground, and ensuring ROI for stakeholders – and it involves more than technical ability. An innovative culture and strong partnerships with like-minded organizations could significantly improve the capabilities of the directorate over the long term, she said.

Carrano agreed with her assessment and observed that innovation involved not just the successful development of useful products or processes, but also the ability to ensure their widespread delivery and use. **O'Toole** noted that S&T is in a strong position to identify future

trends, given the scope of its mission and the breadth of its stakeholders and partners. **Bellovin** commented on the difficulty finding the right balance between innovation and partnerships, and the importance of recognizing cascading consequences and ripple effects. He added that partnering with industry is a key metric for success. **Depoy** noted that industry partnerships are often hindered by perceptions within the private sector that government partners may back out of a project or that their involvement may become burdensome. **O'Toole** responded that S&T has enjoyed success by working with In-Q-Tel (IQT) as a link to small and innovative organizations. Discussion continued regarding collaboration with industry, academia, and other partners among **Lister, Carley, Kamen, and O'Toole**. **Carley** commented that law enforcement needs to try out new technologies; the key, she said, is the technology infrastructure. **Kamen** mentioned the possibility of an "entrepreneur in residence" and described the role of urgency in driving innovation. **O'Toole** responded that operational urgency sometimes gets in the way of innovation at DHS. Discussion then turned to the importance of achieving large, notable successes. **Lister** mentioned the Apollo and Manhattan projects and observed that S&T could use similar but smaller victories to increase its visibility. **Kamen** commented that big organizations can innovate if they deem it to be critical; for example, DoD finds ways to address requirements rapidly when it is at war. **Carrano** mentioned that S&T needs to figure out how to market itself, which would lead to more successes and increased awareness. **Lister** asked if Components use a red team process, and **O'Toole** confirmed that some do. **Lister** recommended combining red teaming with systems engineering. **Gerstein** responded that the Rio Grande Valley project was based on challenges and requirements from Customs and Border Protection (CBP), and S&T is currently red teaming this project. **Lister** wondered if HSSTAC could help market or coordinate this area. **Gerstein** then mentioned working with Immigration and Customs Enforcement (ICE) on "big data," and **Durham** mentioned that ASOA is working with TSA on next-generation screening. **O'Toole** mentioned the danger of overreach and the need to work with those who are willing and able. **Lister** mentioned that in order to attract the right people and create a culture of innovation, S&T must provide problems that are hard, interesting and important. **Gerstein** mentioned that S&T is broadening stakeholder involvement in its portfolio reviews to help increase buy-in and interest. The committee then reexamined the issue of academic and private sector contributions to S&T, with a specific focus on how to attract the best and brightest innovators. **Carrano** suggested that S&T consider issuing a grand challenge with prize money as a way to incentivize industry. **O'Toole** responded that S&T does have the authority but it is difficult to achieve. **Kamen** mentioned that grand challenges have worked well within industry but it takes time and energy and is a budget challenge. He mentioned the successes of the X-prize and expressed a willingness to help S&T make inroads here if desired – but noted that he does not represent or advocate for it. **Levis** also noted that grand-prize challenges have had a degree of success within industry and academia, but emphasized that the prize should involve vision and not just gadgetry. **Kamen** mentioned the cost of security (especially infrastructure and airline security) and suggested that S&T could demonstrate cost savings by designing a better and more user-friendly system. He acknowledged that this is more of a policy issue than a scientific one, but the public trusts science so perhaps it could be used to influence policy decisions. Discussion continued among **Kamen, Levis, Benda, O'Toole, and Carrano** regarding strategies to engage partners, and using liaison officers or government exchange programs modeled after an academic sabbatical. It concluded with a general consensus that systems analysis and guidance throughout the innovation and transition process would be critical to mission success.

B. EMERGING THREATS

O'Toole opened this discussion by noting that emerging and future threats are often ambiguous and hard to quantify, and that this could be a key area of study for HSSTAC. **Gerstein** briefed the members on S&T's analysis of emerging threats and highlighted the metrics for gauging their scale, threat, and likelihood while noting that technology would play a key role in augmenting prevention or response. **O'Toole** said that one key area for potential HSSTAC focus is in biodefense and clarifying the roles and responsibilities of DHS and its interagency partners, especially DoD. **Gerstein** added that new technologies and practices had created the potential for widespread consequences of certain disasters or attacks—for example, Deepwater and Fukushima—and this is further complicated by the complex relationship between federal and SLTT levels. **O'Toole** commented on the continuing struggle to conceptualize preparations for large-scale catastrophes, given their cascading effects and other contingencies that are difficult to anticipate. At a strategic level, she said one of the primary challenges facing planners and policy makers is the need for situational awareness at all levels of government during a response. **Kamen** mentioned that the World Economic Forum addressed the issue of emerging threats. **Carley** mentioned that social media and other communications tools could prove valuable here, and **Levis** interjected that situational awareness and situational understanding are both critical to proper decision making and equally important. **Casani** agreed with **Levis** and observed that there is often no shortage of information; in fact, decision makers are often faced with an overload of data which needs proper analysis. **Gerstein** concluded the discussion by explaining the directorate's goals for the next QHSR cycle and by inviting advice in this area.

C. BIG DATA

Gerstein opened the conversation by offering questions and challenges, such as how to properly gather, analyze, and understand information and translate it into effective and timely decision-making. **O'Toole** mentioned that one enduring challenge is the need for situational awareness. **Durham** noted that “big data” is largely shaped by analytics and systems engineering, areas in which ASOA is taking a lead. She described ASOA's efforts to focus on the volume, velocity, variety, and trustworthiness of data, and understanding how data evolves during an incident. **Benda** highlighted the variety of areas where DHS could lead, adding that the vast scope and size of the department would require proper data integration and analysis. He referenced ongoing efforts with ICE as an example of success, and argued that S&T could help Components and partners streamline their analysis processes. **O'Toole** mentioned a randomization algorithm, developed by a COE and used by USCG patrols, as an example of that. **Carrano** described the “big data” challenge as a need to synthesize, analyze and filter. **Carley** mentioned an upcoming report from National Academy Press about “big data.” **O'Toole** mentioned bioinformatics as a key “big data” challenge, where many agencies have a role but DHS might be the lead. S&T is interested in rapid diagnostics and is working with DoD in this area, she said. Discussion continued among **O'Toole**, **Kamen**, **Benda**, and **Bellovin** about randomization, visualization, and other “big data” strategies, and focused on the need to protect privacy while maintaining situational awareness and readiness. **Benda** emphasized the need to ensure both security and anonymity. **Lister** commented on the need to prove effectiveness and to transition solutions. The committee's discussion concluded with an emphasis on industry involvement. **Kamen** mentioned that industry leaders like Google could help S&T in this area.

3. ACCELERATING INNOVATION THROUGH SYSTEMS ANALYSIS

Gerstein briefed the committee members on the systems that S&T uses to engage partners in systems analysis and operational requirements generation. He highlighted the role of the Science and Technology Operational Research Enhancement (STORE) project, the DHS Apex teams, and the S&T Resource Allocation Strategy (STRAS), all of which conduct timely and effective coordination with stakeholders. He described the success of partnerships with the U.S. Secret Service (USSS) and CBP. **Lister** asked how long a typical Apex project lasts, and **Benda** replied that it varies depending on the project. **O'Toole** explained that it is an evolving process of systems analysis and engagement. **Carrano** stressed the importance of feedback and coordination and **O'Toole** agreed, adding that this area is an example of the challenges that operationally-focused Components face when trying to articulate their requirements. **Durham** briefed the committee on systems engineering efforts currently underway with CBP regarding surveillance and response capabilities in the Rio Grande Valley; the following discussion focused on the role of stakeholder engagements, field experimentation, and transition. **Benda** discussed S&T's efforts in the area of agricultural screening tools, and how systems engineering in this area could be used to increase detection and response time for zoonotic diseases, which he said would have a dramatic effect on public health and efficiency of operations. **Carrano** supported this notion, highlighting the massive scale and thin profit margins of many commercial food producers. **Bellovin** observed that any HSSTAC efforts involving systems engineering would also benefit from studying the failures or shortcomings of prior projects. **O'Toole** agreed, while clarifying that in many cases, S&T – and DHS at large – would face criticism for the failures of other organizations or projects in which they were not involved. Discussion continued among **Benda, Kamen, Levis, and O'Toole** regarding lessons learned. **Kamen** commented that industry and government could work together in this area; for example, utility companies would be interested because of their concerns about loss of service. He offered to help make connections with industry. **Levis** mentioned the need to show value and market success in a way that is easily understood; for example, using visualization. The discussion ended with a consensus that the need to demonstrate ROI for S&T efforts is critical to long-term success.

4. LEVERAGING INDUSTRY FOR IMPACT

Gerstein opened the discussion by describing various tools S&T uses to guide transition and commercialization, and noted that S&T focuses heavily on tech foraging and learning from industry models and experience. **Benda** commented that HSARPA focuses on building systems that could be leveraged across multiple operational requirements, and highlighted the importance of ensuring that projects stay relevant to customer needs. **Carley** added that crowd-sourcing through university partners could be useful. **Levis** concurred, and emphasized the importance of shaping how partners and consumers consider the implementation of tools at a practical, legal, and cultural level. **Lister** suggested teaming with insurance companies. Discussion continued among **Lister, Carrano, Benda, and Bellovin** regarding past examples of disruptive technologies and ways they have been incorporated into society. Smoke detectors were considered a good example, and the committee discussed the evolution of their design, standardization, and normalization. **Carrano** emphasized the cost-benefit analysis and the need to articulate incentives on all ends of the spectrum. **Lister** suggested that pathways to industry be offered as a form of insurance that could evolve into statutes over time. **Benda** mentioned the

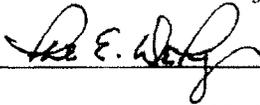
SAFETY Act or SECURE program as a way to cap liability. **Bellovin** responded that the lack of actuarial data can be a problem, especially in cyberspace.

5. **PUBLIC COMMENT:** **Hanson** invited public comment on the above topics. None was offered.

6. DISCUSSION OF NEXT STEPS

HSSTAC Chairman Phil Depoy briefly described the Committee's history and framework and then led the members in a discussion about next steps. **Hanson** offered the use of the Homeland Security Information Network (HSIN) as an option for virtual collaboration and coordination. Several members concurred that a virtual option is a good way to manage scheduling difficulties. **Depoy** solicited member input regarding focus areas and possible subcommittees. **Levis** noted that systems engineering is a likely area for study. **Depoy** agreed, adding that partnering with industry is also key. **Benda** mentioned that input about new starts might be useful, although there is no FY13 budget for them yet. **O'Toole** mentioned that HSSTAC might be able to help identify subject matter experts (SMEs) for new starts. **Kamen** suggested connecting with specific industry SMEs and leveraging them to build prototype solutions. He observed that S&T seems to be well-linked to end users, but lacks good partners "in the middle." **Casani** wondered if HSSTAC should focus more on strategy or more on specific issues. **O'Toole** responded that she would prefer to leverage HSSTAC expertise on specific issues, such as how to teach systems engineering to DHS Components. **Carley** suggested a subgroup to focus on a more unified perspective, perhaps the cyber environment combined with big data and social media, to help define the key issues and who owns which space. **Gerstein** responded that big data in the cyber-environment is a key area but a broad one. **Carrano, Benda, O'Toole, Bellovin, Gerstein, Carley, Lister, and Levis** discussed various areas of potential focus such as biological diagnostics, cyber security, systems analysis and engineering, and networking with interagency leaders. **Carrano** recommended considering a new model for bio-recognition architecture, to leverage economies of scale and sync with industry. **Bellovin** mentioned the need to better understand data visualization. **Carley** mentioned that DARPA is funding projects on visualization in cyberspace, and **Bellovin** cautioned that any visualization efforts must be pertinent to S&T. **Lister** suggested possible ways to help raise the stature of S&T within DHS. **Carrano** suggested that HSSTAC should help identify a few key problems, help S&T to solve them, and then help to market them. **Kamen** commented that technologists seem to always look for a needle in a haystack, when perhaps the focus should be on making the haystack smaller; this would reduce overall cost while increasing efficiency (for example, in airport security). The discussion concluded with agreement on the importance of identifying achievable areas for success, collaboration with industry, and developing good relationships throughout S&T's stakeholder base. **Depoy** closed the discussion by thanking the members for their time and encouraging continued coordination among committee members and with S&T staff.

7. **ADJOURN:** **Hanson** adjourned the meeting at 3:30 p.m.

Signed:  (HSSTAC Chairman Phil Depoy) Date: 12/5/2012

MEETING ATTENDEES

Members:

Steve Bellovin
John Carrano
Kathleen Carley
Julie Casani
Phil Depoy
Dean Kamen
Alex Levis
Mark Lister
Jack Parow

DHS Briefers and Observers:

Georgia Abraham (briefer)
Paul Benda (briefer)
George Boosalis
Troy Byers (briefer)
Gretchen Cullenberg
Bruce Davidson
Shane Davis
Rolf Dietrich
Deborah Durham (briefer)
Dan Gerstein (briefer)
Bob Griffin (briefer)
Herbie Hancock
Mary Hanson
Jamie Johnson
Susan Law
Melissa Mann
Christina Murata
Tara O'Toole (briefer)
Austin Rackets
Sharla Rausch
Ari Schuler
Mark Schroeder (ICE/HSAAC)
Jim Tuttle
Heidi Whiteree
Dick Williams (briefer)
Randy Zeller

Others:

Ken Rapuano – MITRE Corp., former HSSTAC member (briefer)

Members of Public:

John Barsa - MRI Global (VP for Government Relations)
Megan Ignash - Homeland Security Dialogue Forum (Communications Director)
Andrew Jennings - Lews-Burk Associates LLC
Harry Mayfield - Lews-Burk Associates LLC
David Olive - Catalyst Partners (Founder and Principal)
Dave Weideman - PEMA Inc. (President)
Ted Wood - Parks IP Law (patent attorney)

NOTE: All meeting materials (listed below) are posted at <http://www.dhs.gov/st-hsstac>. No handouts were distributed during the meeting.

Meeting Documents:

- Federal Register meeting notices
- Agenda
- Committee Roster
- Speaker Bios
- Member Bios
- Day 1 briefings
- FACA Overview briefing
- Ethics briefing
- HSSTAC briefing
- Day 2 briefings

Read Ahead Materials:

- Homeland Security Act-S&T Section
- Quadrennial Homeland Security Review (QHSR) Executive Summary
- Testimony by Dr. O'Toole subcommittee of the U.S. House of Representatives Committee on Homeland Security on 17NOV11
- Testimony of Dr. Gerstein a subcommittee of the U.S. House of Representatives Committee on Homeland Security on 19APR12
- DHS S&T Strategic Plan 2011
- DHS S&T Year-in-Review 2011